May 25, 2004

U.S. Department of Transportation Dockets
Docket No. FAA-2004-17168
400 Seventh Street, SW
Room Plaza 401
Washington, DC 20590.

SUBJECT: Review of Regulations; FAA Request for Public Comments

Ladies and Gentlemen;

The following is submitted by the Allied Pilots Association in response to the DOT/FAA request for comments on existing Federal Aviation Regulations (FAR's). Based on the request to focus on three major issues, we are providing detail on what we consider to be three high-priority areas. However, there remain numerous additional areas that merit attention throughout Part 121, Subpart Q and R. We strongly encourage the Administrator to consider these inputs as well as the countless others that have been presented and discussed over the past several years and issue the long awaited complete revision that will modernize and streamline the Flight and Duty Limitations and Rest Requirements.

1. **Part 121, Subpart R—Flight Time Limitations: Flag Operations, § 121.481 through § 121.485**

   Unlike Subpart Q, Subpart R does not contain a provision requiring rest for crewmembers on Reserve duty. There is no reasonable or logical explanation for this difference.

   Non-augmented international flights of less than 8 hours on two-pilot aircraft or 12 hours on aircraft requiring two pilots and one additional crewmember (flight engineer) are routinely scheduled between major East Coast U.S. Cities and Europe, or from Southern U.S. cities to South America. While the crew complement on these non-augmented international flights is identical to the crew complement on domestic flights conducted under Subpart Q, only "domestic" reserve pilots are required to receive prospective rest in advance of flight assignments.

   Reserve pilots are particularly prone to pilot fatigue when they do not receive predetermined rest periods because it often results in excessive wakefulness. For example, consider a reserve pilot who awakens at 8 AM and is called for an assignment at 6 PM that begins at 10 PM. Without the benefit of a pre-determined rest opportunity in advance of this assignment, the pilot could be awake for more than 24 consecutive hours at the end of the duty period. In fact, many reserve pilots have reported pilot fatigue after being awake for 16 to 18 hours--a finding consistent with scientific research, and have often been awake as long as 20-24 hours during the critical approach and landing phase.

   Scientific research has identified several factors that exacerbate the onset of fatigue. The most significant finding is that excessive wakefulness, categorized as "time since

awakening" (TSA), is a primary cause of fatigue onset. Research has proven that performance impairment after a TSA of 17 hours is equivalent to a person who is legally intoxicated (.05% blood alcohol) according to current FARs. Additionally, flight time and duty that occurs at night carries a severe fatigue penalty due to the disruption of a pilot's natural circadian cycle. International pilots are particularly prone to fatigue because their flights are lengthy, often occur during the late night to pre-dawn hours, and often cross multiple time zones causing jet lag.

With these concepts in mind, the following language is recommended to supplement the existing language until such time that a complete rewrite is adopted. In any case, Subpart R should be modified to include a provision that provides rest for Reserve crewmembers.

In § 121.481, add the following new letter (b) and renumber accordingly:

(b) No certificate holder conducting flag operations may schedule a flight crewmember and no flight crewmember may accept an assignment for flight time during the 24 consecutive hours preceding the scheduled completion of any flight segment without a scheduled rest period during those 24 hours of at least 10 consecutive hours. This may be scheduled for or reduced to a minimum of 9 hours if the flight crewmember is given a rest period at the completion of the first duty period of any assignment that is a minimum of 11 hours that must begin no later than 24 hours after the commencement of the reduced rest period.

In § 121.483, add the following new letter (b) and renumber accordingly:

(b) No certificate holder conducting flag operations may schedule a flight crewmember and no flight crewmember may accept an assignment for flight time during the 24 consecutive hours preceding the scheduled completion of any flight segment without a scheduled rest period during those 24 hours of at least 10 consecutive hours. This may be scheduled for or reduced to a minimum of 9 hours if the flight crewmember is given a rest period at the completion of the first duty period of any assignment that is a minimum of 11 hours that must begin no later than 24 hours after the commencement of the reduced rest period.

Add new paragraph:

§ 121.484 Flight time limitations: Two pilots plus one additional relief pilot.

(a) No certificate holder conducting flag operations may schedule a pilot to fly, in an airplane that has a crew of two pilots and at least one additional flight crewmember, for a total of more than 12 hours during any 24 consecutive hours.

(b) No certificate holder conducting flag operations may schedule a flight crewmember and no flight crewmember may accept an assignment for flight time during the 28 consecutive hours preceding the scheduled completion of any flight segment without a scheduled rest period during

those 28 hours of at least 10 consecutive hours. This may be scheduled for or reduced to a minimum of 9 hours if the flight crewmember is given a rest period at the completion of the first duty period of any assignment that is a minimum of 11 hours that must begin no later than 24 hours after the commencement of the reduced rest period.

(c) If a pilot has flown 20 or more hours during any 48 consecutive hours or 24 or more hours during any 72 consecutive hours, he must be given at least 18 hours of rest before being assigned to any duty with the air carrier. In any case, he must be given at least 24 consecutive hours of rest during any seven consecutive days.

(d) No pilot may fly as a flight crewmember more than—

(1) 120 hours during any 30 consecutive days;
(2) 300 hours during any 90 consecutive days; or
(3) 1,000 hours during any 12-calendar-month period.

Note: The difference between 121.483 and 121.484 is due to the lack of a relief pilot under 121.483. Those pilots are on flight deck duty for the duration of the flight and thus have a shorter overall limit.

In § 121.485, add the following as new letter (b) and renumber accordingly:

(b) No certificate holder conducting flag operations may schedule a flight crewmember and no flight crewmember may accept an assignment for flight time during the 32 consecutive hours preceding the scheduled completion of any flight segment without a scheduled rest period during those 32 hours of at least 10 consecutive hours. This may be scheduled for or reduced to a minimum of 9 hours if the flight crewmember is given a rest period at the completion of the first duty period of any assignment that is a minimum of 11 hours that must begin no later than 24 hours after the commencement of the reduced rest period.

Note: The recommendation in 121.485 is assuming a two pilot crew with two relief pilots. If there is only one relief pilot, then the 32 hours should be reduced to 28 hours as in new 121.484 above. Subpart R has been awaiting revision to correctly address two pilot cockpits since approximately 1989. We recommend correcting that deficiency regardless of whether these recommendations are adopted.

These recommendations are consistent with the guidelines outlined in the 1996 NASA publication “Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation.”

This rule change will significantly reduce flight crew exposure to known fatigue risk. As such, it will raise the bar on flight safety and accordingly, benefit the flying public. Additionally, it will simplify flight crewmember scheduling by providing consistent rest requirements for both Domestic and Flag operations.

2. **Part 121, Subpart Q- Flight Time Limitations and Rest Requirements: Domestic Operations, § 121.471**

The rest requirements in the domestic FAR's are structured primarily around the amount of flying in the previous 24 hours versus the amount of time spent on duty. The fallacy of this concept is twofold:

a. The assumption is that fatigue and the need for rest become more acute as flight time increases, without regard to time spent on duty or time since awake, which is contrary to both scientific and anecdotal evidence and, more importantly,

b. The regulation, as structured, actually encourages scheduling increased time on duty and reduced rest periods, both or which go against the available scientific evidence regarding fatigue. The original intent was that scheduled rest periods would be extended as scheduled flying in the adjacent 24-hour period increased. However, when dealing with major airline schedules and computer-based optimization software, quite the contrary is true.

Major airline schedules are almost completely marketing-driven, and frequently finalized months in advance. Crews are scheduled to operate the airline's flights at lowest cost by a computer program, using FAR's and other carrier and pilot group scheduling rules as "limits".

If flight time in a given 24-hour period increases above 9 hours, the layover length is not and normally cannot be increased by the software. Rather, the software just chooses different legs on Day 1 and/or Day 2 in order to spread the flying out over a longer period, thus ensuring that any "compensatory rest" requirement is not triggered or is reduced. The result, however, is longer duty periods on either side of the layover and no additional rest, increasing both acute and cumulative fatigue and thus reducing safety.

Example:

Pairing "1":

EQ	FLT	DEP TIME	M	ARR TIME	NITE	TOTL	P&C	DUTY	ODL	GND
22	1921	DFW 1730	M	ABQ 1816		1.46			0.45	
22	1060	ABQ 1901		DFW 2143		1.42				0.45
22	60	DFW 2228		SAN 2336		3.08				
'		/LAYOVER AT ABQ/				7.51	0.00	9.21	**9.35**	
22	2059	SAN 1026	D	SFO 1131		1.05				0.50
22	1250	SFO 1221	L	ORD 1851		4.30				
'		/LAYOVER AT LGA/				5.35	0.00	7.37	**11.00**	
22	1876	ORD 0706	L	LGA 0952		1.46				0.58
22	429	LGA 1050	B	DFW 1352		4.02				

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                                        5.48  0.00  8.01 TAFB 47.12
                                      19.14  0.00  19.14
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This pairing is illegal under current FAR's, because look-back at the end of Flight 1250 on Day 2 shows greater than 9 hours of flying in the previous 24 hours. Therefore, the 9.35 layover at the end of Day 1 is "reduced rest", and requires a "compensatory rest" period of at least 12 hours the following day. Since the layover requiring "compensatory rest" is only scheduled to be11 hours, the pairing is illegal.

The pairing could be made legal several ways - for example; perhaps a longer layover is available in ORD after Day 2 to provide the required 12 hours. However, the "fix" is often a pairing that spreads out the flying on either Day 1 or Day 2 as described above, reducing the total flying in the 24-hour window. In the pairing below, the "fix" is that the crew sits on the ground for 4 hours in SFO before departing for ORD.

Revised Pairing "1":

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EQ   FLT DEP TIME M ARR TIME  NITE  TOTL   P&C   DUTY   ODL   GND
22  1921 DFW 1730 M ABQ 1816        1.46                 0.45
22  1060 ABQ 1901   DFW 2143        1.42                      0.45
22    60 DFW 2228   SAN 2336        3.08
'         /LAYOVER AT ABQ/           7.51  0.00   9.21  9.35      '
22  2059 SAN 1026 D SFO 1131        1.05                      4.00
22  1350 SFO 1531 L ORD 2201        4.30
'         /LAYOVER AT LGA/           5.35  0.00  11.10 11.00
22  1876 ORD 1016 L LGA 1302        1.46                      0.58
22   429 LGA 1400 B DFW 1802        4.02
                                     5.48  0.00  8.01 TAFB 47.12
                                   19.14  0.00  19.14
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The "revised" pairing provides no more rest than the original, yet increases the duty day on Day 2 from 7:37 to 11:10. Pilots at American Airlines recently reported in a scheduling survey that long "sits" were very fatiguing, making this "legal" pairing **less safe** at the end of a long duty period. The "revised" (and FAR-legal) pairing ends up terminating at home base over four hours later than the original (illegal) pairing, which adds additional cost to the airline, contributes to cumulative fatigue, and makes the pilot unavailable for additional flying for a longer period of time.

Our recommendation is to modify 121.471 to base rest requirements on "time on duty" rather than flight time while retaining the 8-hour limit for scheduled flying between required rest periods. As long as the rest periods are adequate for the amount of time on duty and the 8-hour flight time limit between rest periods is retained, the amount of flying in a given 24-hour period is essentially irrelevant.

Suggested language follows, which includes changes to the flight time limitations, rest requirements and establishment of duty time limitations. At this point, and without additional scientific information, we have refrained from recommending a yearly limit on duty. We believe that if the other limits established herein are effective in providing necessary restorative rest, then a yearly limit may not be

necessary. Language was changed in other paragraphs as well in an effort to simplify and add clarity.

§ 121.471 Flight time limitations and rest requirements: All flight crewmembers.

(a) No certificate holder conducting domestic operations may schedule any flight crewmember and no flight crewmember may accept an assignment for flight time in scheduled air transportation or in other commercial flying if that crewmember's total flight time in all commercial flying will exceed—

(1) 1,000 hours in any 12 consecutive months;
(2) 100 hours in any calendar month;
(3) 32 hours in any 7 consecutive days;
(4) 8 hours between required rest periods.

(b) No certificate holder conducting domestic operations may schedule any flight crewmember and no flight crewmember may accept an assignment for flight time in scheduled air transportation or in other commercial flying if that crewmember's total scheduled on-duty time in all commercial flying will exceed—

(1) 12 hours between required rest periods;
(2) 44 hours in any 7 consecutive days;
(3) 160 hours in any 30 consecutive days.

(c) Except as provided in paragraph (d) of this section, no certificate holder conducting domestic operations may schedule a flight crewmember and no flight crewmember may accept an assignment for flight time during the 24 consecutive hours preceding the scheduled completion of any flight segment (including post-flight duties) without a scheduled rest period during that 24 hours of at least the following:

(1) 10 consecutive hours for any duty period up to and including 10 hours in length.
(2) For extended duty periods scheduled for more than 10 hours, 10 consecutive hours plus the amount the preceding scheduled duty period exceeds 10 hours.

Transportation to and from the designated rest facility shall be scheduled to provide a minimum 8-hour sleep opportunity at that rest facility.

(d) A certificate holder may, in actual operation, reduce a scheduled minimum rest period by up to one hour. Under such circumstances, the subsequent rest period must be a minimum of 11 hours or the length of the rest period required by the scheduled duty period plus one hour, whichever is greater.

(e) A certificate holder may, in actual operation, increase a crewmember’s duty period up to a maximum of 14 hours due to unforeseen operational circumstances beyond the control of the certificate holder. Under such

circumstances, the subsequent minimum off-duty period shall be increased by the amount of the duty period extension.

(f) Each certificate holder conducting domestic operations shall relieve each flight crewmember engaged in scheduled air transportation from all further duty for at least 36 consecutive hours during any 7 consecutive days, to include the opportunity for two consecutive nights of recovery sleep. To this end, the two nights must provide an 8-hour sleep opportunity, which includes the hours of 0200-0600 local time.

(g) No certificate holder conducting domestic operations may assign any flight crewmember and no flight crewmember may accept assignment to any duty with the air carrier during any required rest period.

(h) Time spent in transportation, not local in character, that a certificate holder requires of a flight crewmember and provides to transport the crewmember to an airport at which he is to serve on a flight as a crewmember, or from an airport at which he was relieved from duty to return to his home station, is not considered part of a rest period. For the purposes of this paragraph, transportation between different airports or from one airport to a rest facility and subsequently to a different airport shall not be considered local in character.

(i) Once a flight crewmember has received a legal schedule under this part, the crewmember may, due to circumstances beyond the control of the certificate holder (such as adverse weather conditions) exceed the flight time limits contained herein in completing that legal schedule. However, the duty limitations and rest requirements contained herein cannot be violated.

These recommend duty limitations and rest requirements are consistent with the guidelines outlined in the 1996 NASA publication “Principles and Guidelines for Duty and Rest Scheduling in Commercial Aviation.”

The benefits are substantial, including a significant simplification in the rest requirements, which will make the rule easier to understand and enforce. Additionally, the traveling public benefits from significantly enhanced safety resulting from rested crewmembers, the crewmembers benefit from improved schedules, reduced fatigue and simplified, understandable regulations and the carriers benefit from reduced scheduling costs and improved crewmember availability from the more generous flight time limits and simplified, understandable regulations.

3. Part 121, Subpart Q and Subpart R, Domestic and Flag Operations.

The current FARs addressing Flight Time Limitations and Rest Requirements fail to address and account for the physiological problems surrounding Back Side Of the Clock (BSOC) flying and associated circadian disruption. Available scientific research has repeatedly identified impaired performance and increased acute fatigue associated with these operations, particularly when operating through the Window of Circadian Low (WOCL). Moreover, resulting daytime rest periods have been shown to be significantly

less effective at reducing both acute and cumulative fatigue. With these considerations in mind, we recommend the following modifications to both Subpart Q and Subpart R:

a. Limit unaugmented (two pilots with no additional crewmembers) duty periods to 10 hours in duration for duty periods that operate through or impinge upon the WOCL by two hours or more. Reduce the maximum duty
b. Prohibit any subsequent landings (unless accepted by the Administrator) within the same duty period following a flight that impinges upon or operates through the crewmember's WOCL.
c. Provide additional rest, both post duty period and during the respective 7-day period, when operating more than two hours into or through the WOCL. For example, increase the recommended 36-hour rest period every seven days to 48 hours.
d. Establish a guideline limiting consecutive missed sleep opportunities such as those that occur when duty on consecutive nights carries more than two hours into or through the WOCL.
e. Require an additional crewmember(s) at a reduced threshold when duty periods operate more than two hours into or through the WOCL. For example, for two pilot aircraft, require one additional pilot when flying exceeds seven hours and duty exceeds 10 hours and the flight operates more than two hours into or through the WOCL. The same principle should be applied to flights requiring more than one additional pilot due to extended flight times or time on duty.

The benefit here applies primarily to the traveling public through significantly enhanced safety obtained from better-rested flight crewmembers. Additionally, the flight crewmembers benefit from the reduction in fatigue-producing schedules. Carriers may benefit from a reduction in missed time and health care costs due to the overall improved health and thus availability of flight crewmembers.

Submitted by Captain Douglas Pinion, Flight Time / Duty Time Committee, Allied Pilots Association.